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**Notes:**

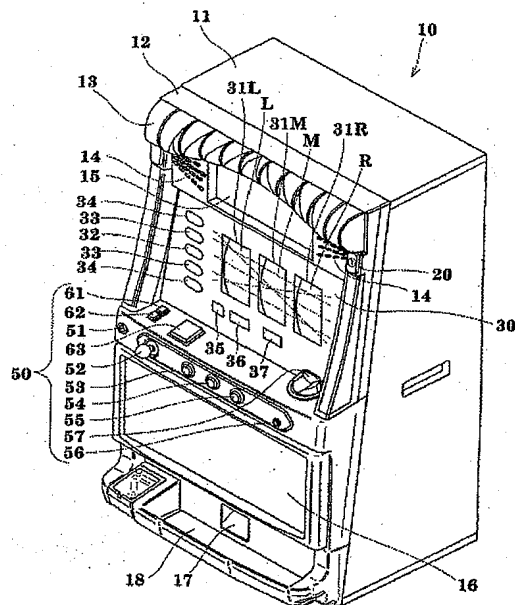
1. Untranslatable words are replaced with asterisks (\*\*\*).
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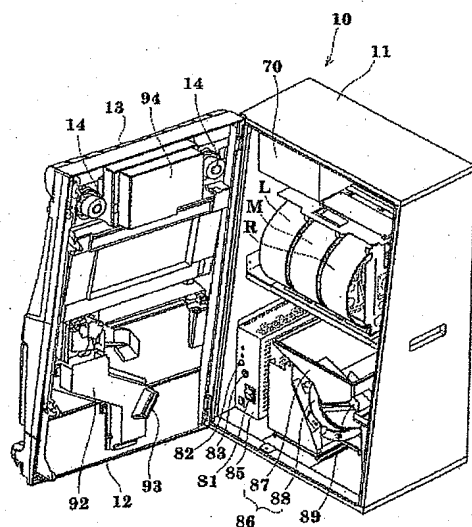
Dictionary: Last updated 03/28/2008 / Priority:

**DRAWINGS**

[Drawing 1]

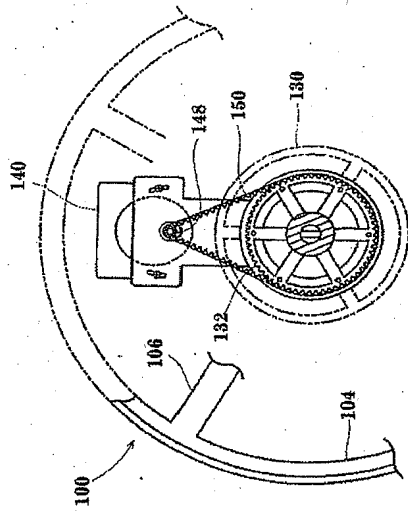


[Drawing 2]

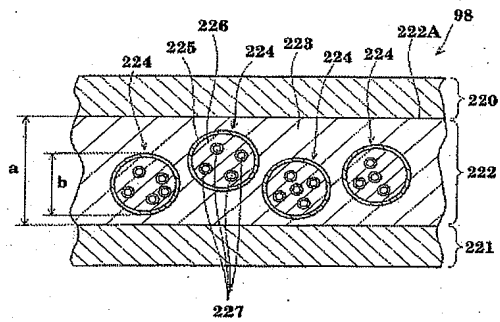


This exploded perspective view shows the assembly 100, which includes a base plate 114 with mounting holes 118. A bracket 120 is mounted to the base plate using screws 122. A wheel 106 is mounted to the bracket 120 via a central shaft 108 and a hub 109. A second wheel 104 is positioned above the first wheel 106, with a gap 98 between them. A third wheel 105 is shown to the left of wheel 104. A component 103, which appears to be a spring or a small motor, is located between the two wheels. A bracket 130 is mounted to the side of the base plate 114, and a component 140 is attached to it. A small component 133 is also shown near the base plate. A label 'L.M.R.' with an arrow points to the base plate 114. Various other parts are labeled with numbers: 112, 116, 109, 105, 104, 98, 208, 110, 150, 132, 136, 148, 134, 106, 108, 122, 109, 120, 118, 114, 130, 140, 133, 103, and 100.

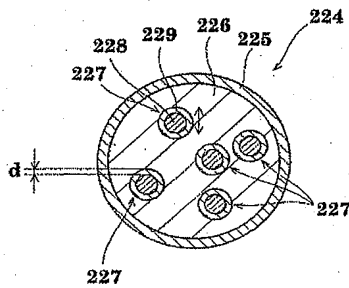
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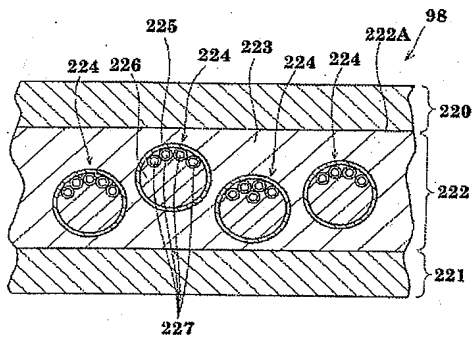
[Drawing 6]



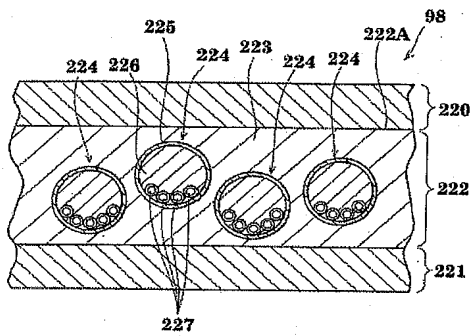
[Drawing 7]



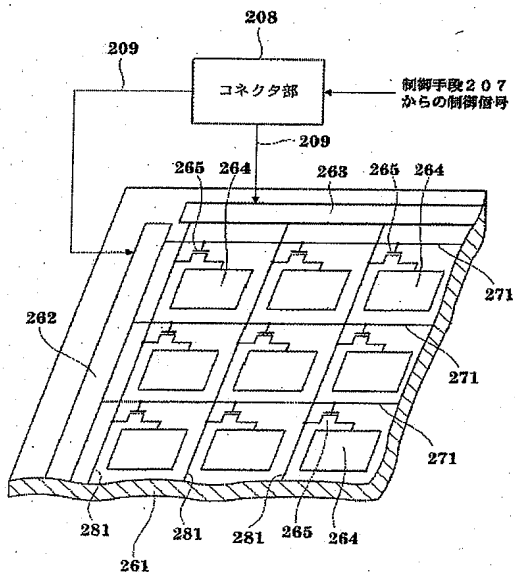
[Drawing 8]



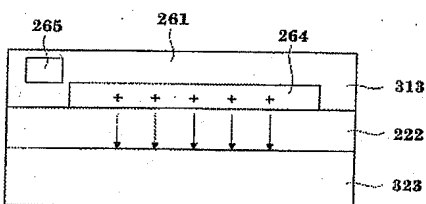
[Drawing 9]



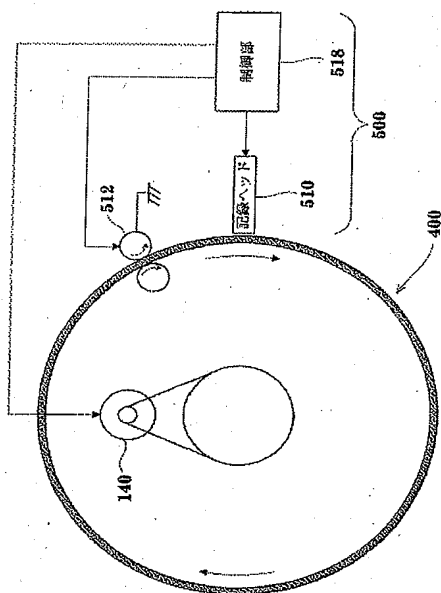
[Drawing 10]



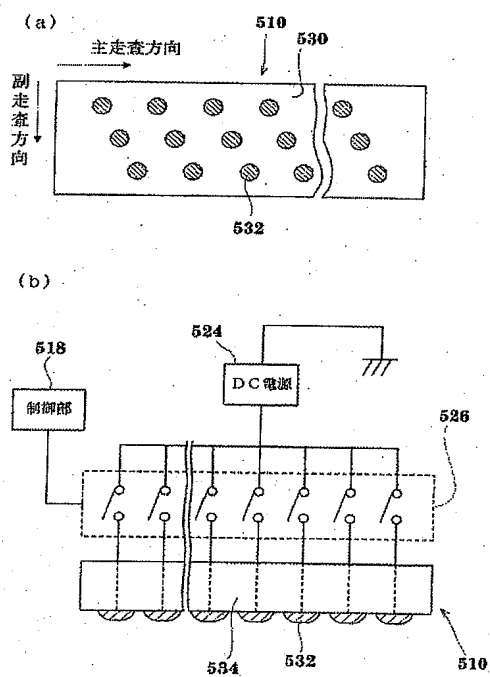
[Drawing 11]



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[Drawing 16]



[Translation done.]

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**CLAIM + DETAILED DESCRIPTION**

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**[Claim(s)]****[Claim 1]**

In the game machine constituted so that the solid of revolution equipped with two or more discernment information might be operated based on formation of starting conditions and said solid of revolution might be stopped based on formation of a condition precedent,  
Said solid of revolution is a game machine characterized by having a display means to display said two or more discernment information by moving the electrification particles in the display layer pinched between the part I material and the part II material, and changing a color.

---

**[Detailed Description of the Invention]**

**[Claim 2]** In a game machine according to claim 1,

It is the game machine characterized by said display means being electronic paper.

**[Claim 3]** In a game machine according to claim 2,

Said electronic paper is a game machine characterized by being annularly attached to said solid of revolution.

**[Claim 4]** In a game machine given in either of Claim 1 to 3,

Said display means is a game machine characterized by being what a color changes and displays said two or more discernment information, when it has two or more capsules and electrification particles move within said capsule into the display layer pinched between the part I material and the part II material.

**[Claim 5]** In a game machine according to claim 4,

Two or more picture electrodes with which said display means forms in either said part I material or the part II material \*\*\*\* impressed to said display layer, It has the change element which was prepared for said every picture electrode and which changes the formation and disappearance of said \*\*\*\* by said picture electrode. Have a common electrode for forming said \*\*\*\* in the another side with said picture electrode, and further [ said display means ] The game machine characterized by having a receiving means to receive the control signal outputted from external apparatus, and the drive control means which carries out drive control of said two or more change elements according to the control signal received with said receiving means.

[0001]

**[Field of the Invention]**

This invention relates to game machines, such as a pachinko machine and a slot machine.

[0002]

**[Description of the Prior Art]**

A pattern sequence stops by two or more pattern sequences' starting change, and pushing a stop switch based on starting conditions being satisfied conventionally, and when this stopped pattern is a predetermined great success pattern, there are game machines, such as a slot machine which will be in a game state advantageous to a game person.

[0003]

**[Problem to be solved by the invention]**

However, in the case of the conventional example which has such composition, there are the following problems. [namely, the pattern sequence in the conventional slot machine ] Consist of installing the two or more rows thing which printed two or more patterns on the band-like film, and was made annular side by side, and model change is faced. Since the film which was being used will be discarded and it will exchange for the new film for new models, there is a problem that abandonment parts called the film of the old model are generated, for example. Moreover, since the clearing work which exchanges for the decomposition work for removing this film on the occasion of

model change and a new film, and is assembled is required, there is also a problem that the work accompanying model change is complicated.

[0004]

This invention is made into one thing of the purpose for which it is made in view of such a situation, and the game machine which can reduce generating of the abandonment parts accompanying model change is offered.

Moreover, this invention is made into one thing of the purpose for which the game machine which can make a model change easily is offered.

[0005]

[Means for solving problem]

This invention takes the following composition, in order to attain such a purpose.

Namely, invention according to claim 1 operates the solid of revolution equipped with two or more discernment information based on formation of starting conditions, and is set to the game machine constituted so that said solid of revolution might be stopped based on formation of a condition precedent. Said solid of revolution is characterized by having a display means to display said two or more discernment information by moving the electrification particles in the display layer pinched between the part I material and the part II material, and changing a color.

[0006]

(An operation and effect) [ according to invention according to claim 1 / the solid of revolution equipped with two or more discernment information ] Since it has a display means to display two or more discernment information by moving the electrification particles in the display layer pinched between the part I material and the part II material, and changing a color, two or more discernment information which was being displayed on the display means can be rewritten and displayed on new discernment information. Therefore, when making a model change etc., the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced. Moreover, since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. As a result, it can respond flexibly to model change and the flexibility of a game machine can be raised.

[0007]

In addition, invention concerning the following game machines is also indicating this Description.

[0008]

(1) In a game machine according to claim 1,

It is the game machine characterized by said display means being electronic paper.

[0009]

Since the display means is used as electronic paper according to invention given in the above (1), two or more discernment information which was being displayed on electronic paper can be rewritten and displayed on new discernment information. Therefore, when making a model change etc., the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced. Moreover, since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. As a result, it can respond flexibly to model change and the flexibility of a game machine can be raised.

[0010]

(2) In a game machine given in the above (1),

Said electronic paper is a game machine characterized by being annularly attached to said solid of revolution.

[0011]

According to invention given in the above (2), since electronic paper does not have angle-of-visibility dependability, even if it is the case where it is legible and is annularly attached to the solid of revolution even from width, it can be conveniently used as a solid of revolution for displaying two or more discernment information.

[0012]

(3) In a game machine given in the above (2),

Said electronic paper is a game machine characterized by being prepared for every solid of revolution of two or more rows.



[0013]

According to invention given in the above (3), by preparing electronic paper for every solid of revolution of two or more rows, and electronic paper not having angle-of-visibility dependability, since it is legible, the discernment information display means for making a game person check the change display result of discernment information by looking can consist of even width suitably.

[0014]

(4) In a game machine according to claim 1 or a game machine given in either of the above (1) to (3), Said display means is a game machine characterized by being what a color changes and displays said two or more discernment information, when it has two or more capsules and electrification particles move within said capsule into the display layer pinched between the part I material and the part II material.

[0015]

According to invention given in the above (4), a color shall change and the display means shall show two or more discernment information, when it has two or more capsules and electrification particles move within a capsule into the display layer pinched between the part I material and the part II material. Also by adopting a such type display means, two or more discernment information which was being displayed on the display means can be rewritten and displayed on new discernment information. Therefore, when making a model change etc., the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced. Moreover, since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. As a result, it can respond flexibly to model change and the flexibility of a game machine can be raised.

[0016]

(5) In a game machine given in the above (4),

Two or more picture electrodes with which said display means forms in either said part I material or the part II material \*\*\*\* impressed to said display layer, It has the change element which was prepared for said every picture electrode and which changes the formation and disappearance of said \*\*\*\* by said picture electrode. Have a common electrode for forming said \*\*\*\* in the another side with said picture electrode, and further [ said display means ] The game machine characterized by having a receiving means to receive the control signal outputted from external apparatus, and the drive control means which carries out drive control of said two or more change elements according to the control signal received with said receiving means.

[0017]

According to invention of a description, to the above (5) [ a display means ] Two or more picture electrodes which form in either the part I material or the part II material \*\*\*\* impressed to a display layer, It has the change element which was prepared for every picture electrode of this and which changes the formation and disappearance of \*\*\*\* by a picture electrode. It had the common electrode for forming \*\*\*\* in that another side with a picture electrode, and this display means is further equipped with a receiving means to receive the control signal outputted from external apparatus, and the drive control means which carries out drive control of two or more change elements according to the control signal received with this receiving means. When it is going to follow, for example, is going to change the contents of a display of a display means like model change That what is necessary is just to receive the control signal from external apparatus with the receiving means of this display means, since a display means can be rewritten and displayed on two or more new discernment information according to this received control signal, a model change can be made still more easily. Moreover, the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced.

[0018]

(6) In a game machine given in the above (5),

Said receiving means is a game machine characterized by having the wiring part which connects the connector area in which connection with said external apparatus is possible, said connector area, and said drive control means.

[0019]

According to invention of a description, to the above (6) [ a receiving means ] Since it has the wiring part which connects the connector area in which connection with external apparatus is possible, a connector area, and a

drive control means External apparatus can be connected to a connector area, a control signal can be received, a display means can be rewritten and displayed on two or more new discernment information according to this received control signal, and a model change can be made easily. Moreover, the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced.

[0020]

(7) In a game machine according to claim 1 or a game machine given in either of the above (1) to (4), The game machine characterized by displaying desired discernment information on said display means using the \*\*\*\* impression head which produces \*\*\*\* in said display means, and a control means to control said \*\*\*\* impression head so that \*\*\*\* according to image data arises in said display means.

[0021]

The \*\*\*\* impression head which produces \*\*\*\* in a display means according to invention given in the above (7), Since desired discernment information is displayed on a display means using a control means to control a \*\*\*\* impression head so that \*\*\*\* according to image data may arise in a display means for example, when it is going to change the contents of a display of a display means like model change By using these \*\*\*\* impression heads and a control means, a display means can be rewritten and displayed on two or more new discernment information, and since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. Moreover, the discernment information on a solid of revolution can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced. Moreover, it is not necessary to equip the display means itself with the matrix circuit for impressing \*\*\*\* to the display layer for every pixel etc., and complication of a display means generation process can be reduced.

[0022]

(8) In a game machine given in the above (7),

It is the game machine characterized by controlling said \*\*\*\* impression head so that \*\*\*\* according to image data arises in said display means while it has the transportation device to which said display means and said \*\*\*\* impression head are moved relatively and said control means controls said transportation device.

[0023]

According to invention of a description, to the above (8) [ a transportation device ] Make it move relatively and a display means and a \*\*\*\* impression head [ a control means ] Since a \*\*\*\* impression head is controlled so that \*\*\*\* according to image data arises in a display means while controlling a transportation device, as the display means surface is scanned, this display means can be rewritten and displayed on two or more new discernment information.

[0024]

(9) In a game machine according to claim 1 or a game machine given in either of the above (1) to (8),

It is the game machine characterized by a color display being possible for said display means.

[0025]

Since the display means is made into the thing in which a color display is possible according to invention given in the above (9), since there is no angle-of-visibility dependability, it is legible even from width, and can be conveniently used as a solid of revolution for displaying two or more discernment information.

[0026]

(10) In a game machine according to claim 1 or a game machine given in either of the above (1) to (9),

It is the game machine characterized by said game machine being a slot machine.

[0027]

According to the game machine given in the above (10), generating of the abandonment parts accompanying model change can be reduced, and the slot machine which can make a model change easily can be offered. In addition, it has the variable display means which gives a definite indication of the discernment information after indicating the discernment information sequence which consists of discernment information on "plurality by dynamic as basic composition of a slot machine. Originate in operation of the operation means for starting (for example, control lever), and dynamic presenting of discernment information is started and it originates in operation of the operation means for a stop (for example, stop button). Dynamic presenting of discernment information is suspended by carrying out predetermined time progress, and it becomes or the game machine equipped with a special game state generating means to generate a special game state advantageous to a game

erson", by making for the definite discernment information at the time of the stop to be specific discernment information into a necessary condition. In this case, as for the medium for games, coin, a medal, etc. are mentioned as an example of representation.

028]

1) In a game machine according to claim 1 or a game machine given in either of the above (1) to (9), is the game machine characterized by said game machine being a pachinko machine.

029]

According to the game machine given in the above (11), generating of the abandonment parts accompanying model change can be reduced, and the pachinko machine which can make a model change easily can be offered. In addition, as basic composition of a pachinko machine, have an operation handle, and predetermined carries out game field discharge of the ball as a medium for games according to operation of the operation handle. That by which the definite stop of the discernment information, including pattern etc., by which a dynamic indication of the ball is given in the display device by making into a necessary condition to win a prize of the operation mouth arranged in the predetermined position in a game field (or an operation gate passage) is carried out after predetermined time is mentioned. Moreover, at the time of generating of a game state, the variable winning-a-prize equipment (specific winning-a-prize mouth) arranged in the predetermined position in a game field is wide opened in a predetermined mode specially, and winning a prize of a ball is enabled. What the valuable value (not only a premium ball but the data written in a magnetic card is included) according to the winning-a-prize number given is mentioned.

030]

2) In a game machine according to claim 1 or a game machine given in either of the above (1) to (9), said game machine is a game machine characterized by uniting a pachinko machine and a slot machine.

031]

According to the game machine given in the above (12), the thing which can reduce generating of the abandonment parts accompanying model change, and can make a model change easily and with which the pachinko machine and the slot machine were united can be offered. In addition -- this -- as basic composition though it was made to unite "It has the variable display means which gives a definite indication of the discernment information after indicating by dynamic the discernment information sequence which consists of two or more discernment information. Originate in operation of the operation means for starting (for example, control lever), and dynamic presenting of discernment information is started and it originates in operation of the operation means for a stop (for example, stop button). Or by carrying out predetermined time progress, dynamic presenting of discernment information is suspended and it makes for the definite discernment information at the time of the stop to be specific discernment information into a necessary condition. While having a special game state generating means to generate a special game state advantageous to a game person and using a ball as a medium for games The ball of a predetermined number is needed when starting dynamic presenting of said discernment information, and it becomes the game machine constituted so that many balls may pay out when generating a game state specially."

032]

mode for carrying out the invention]

With reference to Drawings, the work example of this invention is explained hereafter.

This example explains using a slot machine as an example of a game machine. In addition, naturally it is possible to use this invention for the pachinko machine which is a kind of a pinball machine, and the game machine of others especially, such as the 1st sort pachinko game machine, and the 3rd sort pachinko game machine (called a light thing), a coin game machine.

033]

The 1st work example)

Drawing 1 is a perspective view in the state where the front door of the slot machine of the 1st work example of this invention was closed, and drawing 2 is a perspective view in the state where the front door of the slot machine was opened. The front door 12 sets the axis of rotation as the left side, the slot machine 10 of the 1st work example is attached to a main part 11 possible [ rotation ], and where the front door 12 is closed, the front door 12 and a main part 11 can be locked with the locking mechanism 20.

034]

Up lamp 13 which lights up or blinks with advance of a game at the front door 12, The speakers 14 and 14 which sound various sound effects or report a game state to a game person with advance of a game, The liquid crystal display 15 which displays the various contents of a display, and the game panel 30 which each predetermined range of left rotary drum equipment L, inside rotary drum equipment M, and right rotary drum equipment R can see through, The final controlling element 50 in which the various buttons 51, 53-56, 61-63, the

start lever 52, and the medal entrance slot 57 were formed near the abbreviation middle, It is equipped with the lower-berth plate 16 with which the model name, the character in connection with a game, etc. were displayed, and the medal saucer 18 which receives the medal as a medium for games paid out of the medal expenditure mouth 17.

[0035]

Moreover, the electric power switch 81 which will supply a power supply to each part of a slot machine 10 if turned on inside a slot machine 10, The reset switch 82 operated when resetting a slot machine 10, and by inserting the setting key which is not illustrated The power supply box 85 equipped with the setting key insertion hole 83 whose change of the setting state of a slot machine 10 is enabled, The hopper 86 which consists of expenditure equipment 88 which pays out the medal in the spare tank 87 which stores the medal which has \*\*\*\*\* 9 to the overflowing exterior of a medal, and was thrown in, and this spare tank 87 to the medal expenditure mouth 17 through the opening 93 which leads to the passage 92 for expenditure, The main control unit 70 to which ROM which is constituted as a microcomputer centering on CPU and memorizes a processing program, RAM which memorizes data temporarily, and an input-and-output processing circuit are connected by Bath, It is equipped with the control device 94 for a display which is constituted as the main board case 71 which stores this main control unit 70, and a microcomputer centering on CPU, and controls the contents of a display of the liquid crystal display 15 by the output signal from the main control unit 70.

[0036]

The game panel 30 is equipped with the exposure windows 31L, 31M, and 31R which expose the situation under a stop of left rotary drum equipment L, inside rotary drum equipment M, and right rotary drum equipment R or rotation outside. Five bed lamps 32, 33, 33, 34, and 34 arranged in the left-hand side of the exposure window 31L, The credit number-of-sheets display part 35 which is the thing which is arranged in these exposure windowL [ 31 ], 31M, and 31R bottom, and which displays the number of sheets currently stored in the inside of a slot machine, The number display part 36 of games which is what displays the number of times after how many times JAC pattern formation remains at the time of after how many times JAC (jack) Inn can be carried out at the time of a big bonus, and a JAC game, It has the expenditure number-of-sheets display part 37 which is what displays the number of sheets paid out when the patterns in which it is the same on an effective line won a prize together.

[0037]

The credit button 51 with which the final controlling element 50 was formed in the front part of the front door 12, the start lever 52, the stop button 53 for left rotary drums, the stop button 54 for inside rotary drums, the stop button 55 for right rotary drums, and the return button 56, It has the 61 or 2 57 or 1 medal entrance slot bed button bed button 62 and the Max bed button 63 which were prepared in the level step of the front door 12.

[0038]

Drawing 3 is the exploded perspective view of each rotary drum equipment L, M, and R, drawing 4 is the explanatory view which looked at the inside of each rotary drum equipment L, M, and R from the front, and drawing 5 is the elements on larger scale shown the passive-movement belt pulley 132 of each rotary drum equipment L, M, and R, and focusing on the driving pulley 148. So that each rotary drum equipment L, M, and R may carry out the same composition and it may illustrate The solid of revolution 100 which the pattern as 21 discernment information consists of by holding the electronic paper 98 of the shape of a single cylindrical shape displayed equally in the perimeter part of two support frames 104 formed in the same form, The support axis 110 with which the slot for feed lines which supports this solid of revolution 100 rotatably using two ball bearings 109 was formed, The 1st attachment material 134 which attaches to the support axis 110 the light source 133 which illuminates for the pattern for three pieces towards the front side from the inner side of a solid of revolution 100, It has the stepping motor 140 which used the 2nd attachment material 136 for this 1st attachment material 134, and was attached to it, and the side board 112,114 of the right and left which attach the nothing support axis 110 impossible [ rotation ] using a flange 116,118, and fix the frame of rotary drum equipment L, M, and R. In addition, suppose that it mentions later about the details of electronic paper 98.

[0039]

Two support frames 104 of a solid of revolution 100 are formed of injection molding with resin, and consist of a ring part 105 of a perimeter part, and four radiation supporters 106 which are radiately prolonged in a perimeter part from a rotation center, and support the ring part 105. the side holding the electronic paper 98 of the ring part 105 -- the thickness of electronic paper 98, and abbreviation -- the same slot 107 is formed, and as electronic paper 98 is inserted in this slot 107, electronic paper 98 is attached. In one of four radiation supporters 106, the projection 108 for detecting a rotation position is formed, and the position detection sensor 122 attached to the solid-of-revolution 100 side of the sensor mount 120 attached to the side board 114 can detect now the rotation position of a solid of revolution 100. In addition, as a position detection sensor 122, a photograph sensor can be

used, for example.

[0040]

Moreover, inside the radiation supporter 106 of one support frame 104 of a solid of revolution 100, the passive-movement belt pulley 132 which functions as a gear formed by aluminum of the belt pulley attachment material 130 is attached.

[0041]

The stepping motor 140 is constituted as a common stepping motor of 1 rotation 24 step which has the degree of rotation angle whose step is 15 degrees, and the driving pulley 148 which functions on the driving shaft 142 as a gear through the slowdown gear 146 of gear ratio 1:2 is attached. It enables it to rotate the driving pulley 148 one time by rotating 48 steps of stepping motors 140 by using this slowdown gear 146. That is, the driving pulley 148 will rotate 7.5 degrees by the step of a stepping motor 140. In addition, electric power is supplied from the exterior of a solid of revolution 100 through the feed line 145 and the feed line 144 which have been arranged in the slot of the direction of an axis of the support axis 110 arranged focusing on rotation of a solid of revolution 100 as shown in a stepping motor 140 at drawing 4.

[0042]

[ the passive-movement belt pulley 132 attached to the driving pulley 148 and the support frame 104 of a solid of revolution 100 which were attached to the driving shaft 142 of a stepping motor 140 ] As shown in the expansion explanatory view of drawing 5, the synchronization belt 150 formed of material, such as a synthetic rubber which shows some elasticity, is constructed with some ASOBI. The synchronization belt 150 gets into gear for the tooth formed in the perimeter part of the driving pulley 148 or the passive-movement belt pulley 132 of two or more unevenness formed inside, and it is transmitted to a solid of revolution 100, without sliding on the rotation power of a stepping motor 140. In addition, in the work example, the driving pulley 148 and the passive-movement belt pulley 132 are formed so that the number ratio of teeth may be set to 1:7. This is for only the degree of rotation angle equivalent to one pattern displayed on the electronic paper 98 of the solid of revolution 100 by driving 16 steps of stepping motors 140 making a solid of revolution 100 rotate.

[0043]

The number ratio  $x$  of teeth of the driving pulley 148 and the passive-movement belt pulley 132 (the number of teeth of the number of teeth / driving pulley 148 of the passive-movement belt pulley 132) Several  $Q$  and Step  $S$  [ several ] of a stepping motor 140 of the pattern equally displayed on the electronic paper 98 of the solid of revolution 100, The relation with Step  $n$  [ several ] which only the degree of rotation angle equivalent to a part makes rotate a solid of revolution 100 can express even a pattern by a thing, then the following type (1) without the slowdown gear 146, and if gear ratio  $G$  of the slowdown gear 146 is taken into consideration, a formula (2) can express.

[0044]

$$x-S=n-Q \text{ -- (1)}$$

$$x-S-G=n-Q \text{ -- (2)}$$

[0045]

Therefore, as long as it uses the drive belt pulley 148 and the passive-movement belt pulley 132 so that it may become the number ratio  $x$  of teeth which fills the relation between a formula (1) or a formula (2), what kind of thing is sufficient as several  $Q$  of the pattern equally displayed on Step  $S$  [ several ] and the electronic paper 98 of the stepping motor 140? [ a work example ] So that rotation and a stop can do the stepping motor 140 with 24 steps to which the slowdown gear 146 of the moderating ratio 2 (2:1) was attached, and the solid of revolution 100 by which in other words equal arrangement of the 21 patterns was carried out using the stepping motor 140 with 48 steps for every pattern The driving pulley 148 and the passive-movement belt pulley 132 of the number ratio 7 (1:7) of teeth are used. The pattern displayed on the electronic paper 98 of the solid of revolution 100 by rotation of 16 steps of a stepping motor 140 by this can be rotated by one piece.

[0046]

Next, the structure of electronic paper 98 is explained in detail using drawing 6 and drawing 7. The sectional view in which drawing 6 shows the example of composition of electronic paper 98, and drawing 7 are the sectional views showing the microcapsule of the electronic paper 98 shown in drawing 6.

[0047]

The electronic paper 98 in this work example -- from the first -- \*\* -- although it is beltlike and is a rectangle-like thing, as shown in drawing 3, the both ends of that longitudinal direction are connected, or as a part of those both ends are piled up, it is connected, and it is considered as the shape of a single cylindrical shape, and has pliability.

[0048]

In addition, the electronic paper 98 shown in drawing 6 is a display means (display medium) in which rewriting and

elimination using electrophoresis (Electrophoresis) of a display pattern are possible.

[0049]

This electronic paper 98 consists of electronic ink layers 222 formed between the 1st base material 221 of the shape of a sheet which has flexibility, the 2nd base material 220 of the shape of a sheet which has flexibility, and this 1st base material 221 and 2nd base material 220. The field by the side of drawing 6 Nakagami of the electronic ink layer 222 is the display surface 222A where a display pattern is displayed.

[0050]

The electronic ink layer 222 consists of a binder 223 which has a light transmittance state (it is transparent), and two or more microcapsules 224 currently fixed in the state where it distributed uniformly, in this binder 223. As for thickness a of the electronic ink layer 222, about 1.5 to 2 times of the outer diameter (diameter) b of a microcapsule 224 are desirable. Moreover, as a binder 223, polyvinyl alcohol etc. can be used, for example.

[0051]

As shown in drawing 7, the microcapsule 224 has the main part 225 of a capsule which has a spherical light transmittance state in the air. It fills up with the liquid (solvent) 226 in this main part 225 of a capsule, and two or more electrification particles 227 charged in negative are distributing in this liquid 226. The electrification particles 227 are set up so that the colors of the electrification particles 227 which consist of a core 228 and an enveloping layer 229 which covers this core 228, and a liquid 226 may differ mutually. it is supposed that the color of the electrification particles 227 is white -- the color of a liquid 226 -- blue, red, green, or \*\* -- it is supposed that it is black. It can indicate by a color by carrying out like this.

[0052]

If external \*\*\*\* (electric field) is impressed to a microcapsule 224, the electrification particles 227 will move to the direction and opposite direction of said \*\*\*\* within the main part 225 of a capsule.

[0053]

For example, if the just charged electrode is located in the drawing 8 Nakagami side (display surface 222A side) of a microcapsule 224, \*\*\*\* will arise toward the drawing 8 Nakashita side, and, thereby, the electrification particles 227 will move to the drawing 8 Nakagami side in the main part 225 of a capsule (surfacing). By this electrification particle 227, the color by the side of drawing 8 Nakagami of a microcapsule 224 becomes white.

[0054]

On the contrary, if the electrode charged in negative is located in the drawing 9 Nakagami side of a microcapsule 224, \*\*\*\* will arise toward the drawing 9 Nakagami side, and, thereby, the electrification particles 227 will move to the drawing 9 Nakashita side in the main part 225 of a capsule (subsidence). In this case, since a liquid 226 is located in the drawing 9 Nakagami side in the main part 225 of a capsule, if the color of a liquid is blue, the color by the side of drawing 9 Nakagami of a microcapsule 224 will become blue.

[0055]

Moreover, the microcapsule 224 is constituted so that the specific gravity of a liquid 226 and the specific gravity of the electrification particles 227 may become equal.

[0056]

Thereby, after moving to the drawing 8 Nakagami or drawing 9 Nakashita side, even if \*\*\*\* disappears, it can be located in a fixed position for a long period of time, and, as for the electrification particles 227, drawing 8 of a microcapsule 224 and the color by the side of 9 Nakagami are held for a long period of time at white or the color of a liquid, for example, blue. That is, the display of electronic paper 98 is held for a long period of time.

[0057]

In addition, what is necessary is just to adjust thickness [ of an enveloping layer 229 ] d etc., for example, in order to make equal the specific gravity of a liquid 226, and the specific gravity of the electrification particles 227. As for the outer diameter b of a microcapsule 224, 180 micrometers or less are desirable, and its about 10-20 micrometers are more desirable. As a core 228 of the electrification particles 227, TiO<sub>2</sub> (rutile structure) etc. can be used, for example. Moreover, as an enveloping layer 229 of the electrification particles 227, polyethylene etc. can be used, for example. Moreover, as a liquid 226, what dissolved ANTORAKIN system dye in an ethylene tetrachloride and iso paraffine can be used, for example.

[0058]

In addition, the 1st base material 221 mentioned above is equivalent to the part I material in this invention. The 2nd base material 220 mentioned above is equivalent to the part II material in this invention, the electronic ink layer 222 mentioned above is equivalent to the display layer in this invention, the microcapsule 224 mentioned above is equivalent to the capsule in this invention, and the electronic paper 98 mentioned above is equivalent to the display means in this invention.

[0059]

The common electrode (lower electrode) 323 is formed in the 1st base material 221. Moreover, the circuit board



313 equipped with two or more picture electrodes (up electrode) is formed in the 2nd base material 220. Drawing 10 is the figure showing the circuit composition of the circuit board 313 typically. As shown in drawing 10, this circuit board 313 has the substrate 261 made of resin which has flexibility (pliability).

[0060]

The picture electrode 264 of two or more quadrangles arranged in the shape of a procession on this substrate 261 (arrangement), Two or more thin-film transistors (TFT) 265 which change the flow of each picture electrode 264, and un-flowing, respectively, The gate driver 262 which impresses voltage (signal) to the gate of each thin-film transistor 265, The source driver 263 which impresses voltage (signal) to the source of each thin-film transistor 265, two or more gate lines 271 prolonged in the transverse direction in drawing 10, and two or more source lines 281 prolonged in the lengthwise direction in drawing 10 are formed, respectively.

[0061]

One picture electrode 264 is equivalent to 1 pixel (dot). Moreover, although the pitch in particular of each picture electrode 264 is not limited, its 500 - 5000dpi (dot/inch) grade is desirable. In addition, it cannot be overemphasized that the form of the picture electrode 264 is not limited to a quadrangle. Moreover, the pattern of the arrangement of the picture electrode 264 does not interfere, even if it was not limited in the shape of a procession, for example, the picture electrode 264 is located in a line in the shape of a delta.

[0062]

The arrangement of the Nth transverse direction is hereafter called "Nth line (eye N line)" from "the 1st line (1st line)" and the bottom for the arrangement of the transverse direction of most a top among drawing 10. Moreover, the arrangement of the Nth lengthwise direction is called "Nth row (eye N sequence)" from "the 1st row (1st row)" and left-hand side for the arrangement of the lengthwise direction of most left-hand side among drawing 10.

[0063]

Two or more gate lines 271 prolonged in the transverse direction in drawing 10 are connected to the gate driver 262, respectively. Moreover, two or more source lines 281 prolonged in the lengthwise direction in drawing 10 are connected to the source driver 263, respectively. And the gate of each thin-film transistor 265 is connected to the corresponding gate line 271, respectively. Moreover, the source of each thin-film transistor 265 is connected to the corresponding source line 281, respectively, and the drain of each thin-film transistor 265 is connected to the corresponding picture electrode 264, respectively.

[0064]

A gate driver 262 scans the gate line 271 one by one to every one line (line). [ scan / for example, / "the gate line 271 of eye N line is scanned" ] During the scanning time (time) t impresses voltage (scanning voltage) to the gate of all the thin-film transistors 265 of eye N line, and it says that during the scanning time t turns ON all the thin-film transistors 265 (gate of the thin-film transistor 65) of eye N line. Thus, the role of a gate driver 262 is that the next of eye N line scans the next of the N+1st line and the N+1st line one by one with the N+2nd line, i.e., during the scanning time t makes all the thin-film transistors 265 of the line turn on per line, (every line) one by one.

[0065]

When the source driver 263 is also called a data line drive circuit and scanning voltage is impressed to the predetermined gate line 271, That is, when the thin-film transistor 265 of a predetermined line turns all on; it is the circuit which impresses the voltage according to a control signal (signal which shows a display pattern) to the picture electrode 264 through the source line 281 and said thin-film transistor 265.

[0066]

When scanning voltage is impressed to the predetermined gate line 271, the corresponding picture electrode 264 flows by impressing said voltage to the predetermined source line 281. When the voltage (potential) of a predetermined size (for example, V volt) is impressed to the picture electrode 264 which corresponds, for example by this, as shown in drawing 11, the picture electrode 264 can just be electrified. In addition, the potential of the common electrode 323 is set as  $V/2v$ , and \*\*\*\* is formed toward the common electrode 323 (it produces). moreover, when the voltage (potential) of a predetermined size (for example, 0v) is impressed to the corresponding picture electrode 264 Since the potential of the common electrode 323 is set as  $V/2v$ , as shown in drawing 12, the picture electrode 264 can be electrified in negative, and \*\*\*\* is formed toward the picture electrode 264 (it produces). Thereby, two \*\*\*\* from which a direction differs are alternatively formed between each picture electrode 264 and the common electrode 323, and a display pattern is displayed on it. In addition, since two \*\*\*\* from which a direction differs can be alternatively formed between each picture electrode 264 and the common electrode 323, a display pattern can be overwritten.

[0067]

Although the size in particular of the voltage (potential difference of the picture electrode 264 and the common

electrode 323) impressed between the picture electrode 264 and the common electrode 323 is not limited, it is an absolute value, its 10v or more is desirable, and its 20v or more is more desirable.

[0068]

The connector area 208 for electronic paper 98 being connected to a gate driver 262 and the source driver 263, and receiving a control signal from the external control means 207, as shown in drawing 10, It has the wiring part 209 which connects the connector area 208, a gate driver 262, and the source driver 263, respectively. In addition, the connector area 208 is formed in the predetermined position of the left lateral of electronic paper 98 in one, as shown in drawing 3. The drive of each thin-film transistor 265 is controlled by the control means 207 through a gate driver 262 and the source driver 263, respectively. The control means 207 usually consists of integrated circuits which consist of a logic circuit, a memory circuit, etc., and controls said each thin-film transistor 265.

[0069]

In addition, the thin-film transistor 265 mentioned above is equivalent to the change element in this invention, the connector area 208 and the wiring part 209 which were mentioned above are equivalent to the receiving means in this invention, and the gate driver 262 and the source driver 263 which were mentioned above are equivalent to the drive control means in this invention.

[0070]

Here, how to control the voltage (potential) of the picture electrode 264 of the 2nd above-mentioned base material 220 and the common electrode 323 of the 1st base material 221 is explained using drawing 13. Drawing 13 is the figure showing the voltage (potential) of the picture electrode 264 of the 2nd base material 220, and the common electrode 323 of the 1st base material 221, and the display pattern corresponding to it.

[0071]

By this method, in forming a display pattern in electronic paper 98, it sets the voltage 242 of the common electrode 323 as the middle value (mean value = steady value) of the peak price of the voltage 241 of the picture electrode 264, and the minimum value. That is, when the voltage 241 of the picture electrode 264 changes from 0 to V volt (a peak price = V volt, the minimum value = in the case of 0v), the voltage 242 of the common electrode 323 is set as  $V/2v$ .

[0072]

For example, when drawing the display pattern 243 shown in drawing 13 in the predetermined line of electronic paper 98 and the gate of the thin-film transistor 265 of the line corresponding to the line turns on, The voltage of the voltage shown in the source of those thin-film transistors 265 by the voltage pattern 241a, i.e., 0, and V volt is impressed. The voltage 242 of the common electrode 323 is set to the voltage shown by the voltage pattern 242a, i.e.,  $V/2v$ , in that case.

[0073]

When it does in this way, for example [ eye a sequence (N-2) ] Since the voltage 241 of the picture electrode 264 is V volt and the voltage 242 of the common electrode 323 is  $V/2v$  \*\*\*\* is formed toward the common electrode 323 from the picture electrode 264, each electrification particle 227 of electronic paper 98 moves to the drawing 8 Nakagami side in the main part 225 of a capsule, respectively, and the color of the display surface 222A of electronic paper 98 becomes white.

[0074]

On the contrary, since the voltage 241 of the picture electrode 264 is 0v and the voltage 242 of the common electrode 323 is  $V/2v$  in eye a sequence (N-1) \*\*\*\* is formed toward the picture electrode 264 from the common electrode 323, each electrification particle 227 of electronic paper 98 moves to the drawing 9 Nakashita side in the main part 225 of a capsule, respectively, and the color of the display surface 222A of electronic paper 98 becomes blue.

[0075]

The voltage 241 of the picture electrode 264 is hereafter followed about eye N sequence - (N+3) eye a sequence similarly. The direction of \*\*\*\* formed between the picture electrode 264 and the common electrode 323, i.e., the color of electronic paper 98, can be decided, and the display pattern 243 can be drawn in the predetermined line of electronic paper 98.

[0076]

thus, the color of the predetermined part (pixel) of the display surface 222A of electronic paper 98 ]  
controlling each picture electrode 264 and the common electrode 323 of electronic paper 98 irrespective of what color the color of the display surface 222A of electronic paper 98 had turned into before, since it is uniquely decided only by the voltage 241 of the picture electrode 264 ] A display pattern can be drawn to the electronic paper 98 (the pattern of white and blue is decided uniquely). That is, a display pattern can be overwritten at electronic paper 98, and predetermined display patterns, such as a character, a number, and a figure, can be



repeatedly drawn to electronic paper 98.

[0077]

[ according to the slot machine 10 of the 1st work example / the solid of revolution 100 equipped with the pattern (discernment information) of plurality (for example, 21 pieces) ] as mentioned above Since it has the electronic paper 98 which displays two or more patterns by moving the electrification particles 227 in the electronic ink layer 222 pinched between the 1st base material 221 and the 2nd base material 220, and changing a color Two or more patterns which were being displayed on electronic paper 98 can be rewritten and displayed on a new pattern. Therefore, when making a model change etc., the pattern of a solid of revolution 100 can be rewritten and changed into a new pattern. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution 100 can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution 100, and generating of the abandonment parts accompanying model change can be reduced. Moreover, since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. As a result, it can respond flexibly to model change and the flexibility of a game machine can be raised.

[0078]

Moreover, since electronic paper 98 does not have angle-of-visibility dependability, even if it is the case where it is legible and is annularly attached to the solid of revolution 100 even from width, it can be conveniently used as a solid of revolution 100 for displaying two or more patterns.

[0079]

Moreover, by forming electronic paper 98 every solid of revolution 100 of two or more rows, and electronic paper 98 not having angle-of-visibility dependability, since it is legible, the discernment information display means for making a game person check the change display result of a pattern by looking can consist of even width suitably.

[0080]

Moreover, a color shall change and electronic paper 98 shall show two or more patterns, when it has two or more microcapsules 224 and the electrification particles 227 move within a microcapsule 224 into the electronic ink layer 222 pinched between the 1st base material 221 and the 2nd base material 220. Also by adopting such type electronic paper 98, two or more patterns which were being displayed on electronic paper 98 can be rewritten and displayed on a new pattern. Therefore, when making a model change etc., the pattern of a solid of revolution 100 can be rewritten and changed into a new pattern. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution 100 can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution 100, and generating of the abandonment parts accompanying model change can be reduced. Moreover, since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. As a result, it can respond flexibly to model change and the flexibility of a game machine can be raised.

[0081]

Moreover, two or more picture electrodes 264 which form \*\*\*\* which impresses electronic paper 98 to the 2nd base material 220 at the electronic ink layer 222, It has the thin-film transistor 265 which was prepared every picture electrode 264 of this and which changes the formation and disappearance of \*\*\*\* by the picture electrode 264. Equip the 1st base material 221 with the common electrode 323 for forming \*\*\*\* with the picture electrode 264, and further [ this electronic paper 98 ] The connector area 208 and the wiring part 209 for receiving the control signal outputted from external apparatus, It has the gate driver 262 and the source driver 263 which carry out drive control of two or more thin-film transistors 265 according to the control signal received in this connector area 208 and the wiring part 209. When it is going to follow, for example, is going to change the contents of a display of the electronic paper 98 like model change That what is necessary is just to receive the control signal from external apparatus in the connector area 208 and the wiring part 209 of this electronic paper 98, since electronic paper can be rewritten and displayed on two or more new patterns according to this received control signal, a model change can be made still more easily. Moreover, the pattern of a solid of revolution 100 can be rewritten and changed into new discernment information. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution 100 can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution 100, and generating of the abandonment parts accompanying model change can be reduced.

[0082]

(The 2nd work example)

Next, the slot machine of the 2nd work example of this invention is explained. It differs greatly in that the electronic paper 400 with which kinds differ in the electronic paper 98 of the 1st work example mentioned above

is used for the slot machine of the 2nd work example.

[0083]

The electronic paper 400 of the slot machine of this 2nd work example is equipped with the particle layer 443 which enclosed the particles 436 and 438 of two colors between the display board 440 and the non-displaying substrate 442 as shown in drawing 14. The display board 440 consists of electron hole transportability films. After adding about 40weight % and distributing uniformly N-MECHIRUKARUBAZORU diphenyl HIDORAZON which is an electron hole transportation substance in polyethylene resin as this electron hole transportability film, for example, What was fabricated in thickness of about 50 micrometers, the thing fabricated in thickness of about 50 micrometers by making into electric charge transportability material what added about 40weight % and distributed uniformly beta and beta-bis(methoxypheny) vinyl diphenyl HIDORAZON which is an electron hole transportation substance in polyethylene resin, etc. can be used.

[0084]

On the other hand, the non-displaying substrate 442 consists of films of the two-layer structure which formed the electrode layer 444 about 50 micrometers thick in the above-mentioned electric charge transportability film 441. As an electric charge transportability film used for the non-displaying substrate 442, like the display board 440, the electron hole transportability film which conveys an electron hole may be used, and the film which conveys the electronic transportability film and electron hole to which an electron is conveyed, and an electron can also be used.

[0085]

moreover, between the display board 440 and the non-displaying substrate 442 While the spacer 446 is formed for every fixed interval of about 100 micrometers, for example and the distance of the display board 440 and the non-displaying substrate 442 is always uniformly held by this spacer 446, the cell is formed between spacers 446. In addition, this spacer 446 can be formed in one substrate of the display board 440 and the non-displaying substrate 442 by screen-stencil, for example.

[0086]

One particle 436 can use the black real ball-like conductivity particles which are conductive particles, for example, consist of amorphous carbon of the average particle diameter of 20 micrometers, and about 10 to 2 ohm-cm of resistance among the particles 436 and 438 of two colors enclosed with the cell between the display board 440 and the non-displaying substrate 442. The black real ball-like conductivity particles which consist of this amorphous carbon are obtained by carrying out carbonation calcination of the thermosetting phenol resin.

[0087]

In addition, the conductive particles described in this 2nd work example can move an electric charge by contact with a substrate. The material which has this function is the particles of metal, such as carbon black, nickel, silver, gold, and tin, or the particles which covered or contained those material on the particle surface, for example.

[0088]

Moreover, the particles 438 of another side can choose the real ball particles which consist of a bridge construction copolymer which are the insulating white particles which achieve the duty as concealment particles, for example, makes the main ingredients the JIBINIRU benzene of about 20 micrometers of particle diameter among the particles of two colors.

[0089]

In the 2nd work example, these two kinds of particles 436 and 438 were mixed in equivalent amount, and about 50% of the filling factor has enclosed between a display board and a non-displaying substrate. In addition, you may enclose so that white particles may increase more than black particles, and a mixed rate can be adjusted suitably.

[0090]

In addition, it is also possible to display a color picture instead of the conductive black particles 436 by adopting the trichromatic conductive particles (for example, conductive particles colored yellow, magenta, cyanogen, etc.) of a color.

[0091]

In addition, the non-displaying substrate 442 mentioned above is equivalent to the part I material in this invention. The display board 440 mentioned above is equivalent to the part II material in this invention, the particle layer 443 mentioned above is equivalent to the display layer in this invention, the particles 436 mentioned above are equivalent to the electrification particles in this invention, and the electronic paper 400 mentioned above is equivalent to the display means in this invention.

[0092]

As shown in drawing 15, the slot machine of the 2nd work example can rewrite the display of the electronic

paper 400 of the solid of revolution of the slot machine of this 2nd work example by using the external apparatus (image formation equipment) 500 which is another object. Drawing 15 is the mimetic diagram showing signs that the electronic paper 400 of the solid of revolution 100 of a slot machine 10 is rewritten using external apparatus 500. The recording head 510 which makes the position corresponding to the image data of electronic paper 400 in this external apparatus generate \*\*\*, It has the refreshment electrode 512 which makes electronic paper 400 generate \*\*\* uniformly, and the control part 518 which controls impressed electromotive force so that voltage is impressed to the recording head 510 according to image data and \*\*\* according to image data is added to electronic paper 400.

[0093]

The control part 518 is connectable with the stepping motor 140 for rotating a solid of revolution, and a solid of revolution can be rotated by carrying out rotation control of the stepping motor 140.

[0094]

As shown in drawing 16 (a) and drawing 16 (b), the substrate 534 to which the recording head 510 changes from the material which has the elasticity of rubber etc., for example, and a section are half-ellipses-like, and a diameter consists of two or more electrodes 532 of abbreviation hemisphere type projected on the outside which is 100 micrometers.

[0095]

Since it has elasticity, for example, even if a substrate 534 has unevenness in the surface of electronic paper 400, it changes according to unevenness. Therefore, a contact state with electronic paper 400 becomes always good, and \*\*\* which reflected image data correctly can be added to electronic paper 400.

[0096]

Moreover, two or more electrodes 532 are arranged in the shape of a matrix in one field of the substrate 534 used as the record side 530, as shown in drawing 16 (a). namely, the electrode sequence arranged in one row by the predetermined interval along the cross direction (namely, the main scanning direction) of electronic paper 400 is not overlapped in the subscanning direction — as — two or more rows — for example, three rows are arranged and it is considered as the shape of a matrix.

[0097]

As shown in drawing 16 (b), the DC power supply 524 is connected to each electrode 532 through the connection control part 526, and DC voltage is impressed to it. The connection control part 526 consists of two or more switches by which one end was connected to the electrode 532, and the other end was connected to the DC power supply 524.

[0098]

On-off control of these switches is carried out by the control part 518, and they connect the DC power supply 524 and an electrode 532 electrically so that voltage may be impressed only to the electrode 532 of a position according to image data based on the directions from the control part 518.

[0099]

Moreover, the refreshment electrode 512 consists of a pair of elastic rollers which consisted of elastic material. This elastic roller consists of two conductive rubber rollers which added carbon black to rubber and were fabricated cylindrical to it, and is connected to DC power supply (illustration abbreviation), and the voltage which superimposed DC voltage is impressed.

[0100]

This refreshment electrode 512 adds \*\*\* with the recording head 510 uniform to the direction and opposite direction of \*\*\* which are added to electronic paper 400 according to image data to electronic paper 400 by rotating, where electronic paper 400 is pinched.

[0101]

In addition, the recording head 510 mentioned above is equivalent to the \*\*\* impression head in this invention, the stepping motor 140 mentioned above is equivalent to the transportation device in this invention, and the control part 518 mentioned above is equivalent to the control means in this invention.

[0102]

Here explains the case where a picture is formed in the electronic paper 400 of the above-mentioned composition, by such external apparatus 500 of composition.

[0103]

As shown in drawing 15, the control part 518 of external apparatus 500 is carrying out rotation control of the stepping motor 140, and rotates electronic paper 400 continuously at predetermined speed. The refreshment electrode 512 is making the electronic paper 400 to rotate contact, and adds \*\*\* one by one over the whole surface of electronic paper 400. Since the display board 440 is tinged with a negative electric charge, a positive electric charge is poured in from the non-displaying substrate 442 by this, all the black particles 436 of electronic

paper 400 inside are just charged and it is drawn to the display board 440, as for the display board 440 of electronic paper 400, the whole surface becomes black.

[0104]

Since the recording head 510 is formed in the latter part of the refreshment electrode 512, the recording head 510 adds \*\*\*\* to the position according to image data to the electronic paper 400 which passed the refreshment electrode 512. Since the display board 440 of the field where \*\*\*\* was added is tinged with a positive electric charge with the recording head 510, the just charged black particles 436 which were drawn into the portion move to the direction of the non-displaying substrate 442. Therefore, the field where the black particles 436 of the display board 440 have not adhered becomes white, and the picture by the contrast of black and white is formed in electronic paper 400.

[0105]

In addition, in order to make the position according to image data into a picture by making it separate the black particles 436 from the display board 440 here, and making the position white, it is a position which does not form a pixel. [ of course, the state where gave the positive electric charge with the refreshment electrode, and it was made to separate the black particles 436 from the display board 440 ] When give a negative electric charge by the recording head 510, making the black particles 436 adhere to the display board 440 and displaying a picture, the position according to image data is a position which forms a pixel.

[0106]

The recording head 510 which produces \*\*\*\* in electronic paper 400 according to the slot machine 10 of the 2nd work example as mentioned above, Since a desired pattern is displayed on electronic paper 400 using the control part 518 which controls the recording head 510 so that \*\*\*\* according to image data may arise in electronic paper 400 for example, when it is going to change the contents of a display of the electronic paper 400 like model change By using these recording heads 510 and the control part 518, electronic paper 400 can be rewritten and displayed on two or more new patterns, and since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, a model change can be made easily. Moreover, the pattern of a solid of revolution 100 can be rewritten and changed into a new pattern. Since part exchange of exchanging the solid of revolution itself for a new solid of revolution can be made unnecessary, continuous use of this solid of revolution 100 can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution 100, and generating of the abandonment parts accompanying model change can be reduced. Moreover, it is not necessary to equip electronic paper 400 the very thing with the matrix circuit for impressing \*\*\*\* to the particle layer 443 for every pixel etc., and complication of an electronic paper generation process can be reduced.

[0107]

Moreover, move a stepping motor 140 relatively and electronic paper 400 and the recording head 510 [ the control part 518 ] Since the recording head 510 is controlled so that \*\*\*\* according to image data arises in electronic paper 400 while controlling a stepping motor 140, as the electronic paper 400 surface is scanned, this electronic paper 400 can be rewritten and displayed on two or more new patterns.

[0108]

thus, [ this electronic paper 40 ] since the display of electronic paper 400 can be rewritten by using external apparatus 500 It cannot be overemphasized that an above-mentioned matrix circuit (circuit which consists of the picture electrode 264, a thin-film transistor 265, a driver 262, 263, etc.), the above-mentioned connector area 208 (refer to drawing 10 ), etc. like electronic paper 98 of the 1st work example are unnecessary.

[0109]

This invention is not restricted to the above-mentioned embodiment, and modification implementation can be carried out as follows.

[0110]

(1) [ in the 1st above-mentioned work example, as shown in drawing 8 and 9, have prepared the matrix circuit which equipped the electronic paper using electrophoresis with two or more picture electrodes 264, thin-film transistors 265, gate drivers 262, and source drivers 263, but ] You may make it establish an above-mentioned matrix circuit in the toner type electronic paper 400 (to refer to drawing 14 ) like the 2nd above-mentioned work example, and the electronic paper of other types.

[0111]

(2) although he is trying to rewrite the display of toner type electronic paper 400 in the 2nd above-mentioned work example by using external apparatus 500 (the recording head 510, the control part 518, etc.) as shown in drawing 14 You may make it rewrite the display of the electronic paper by using external apparatus 500 (the recording head 510, the control part 518, etc.) from the electronic paper 98 of the 1st above-mentioned work example to the thing except a matrix circuit, and the electronic paper of other types.

[0112]

(3) although the display pattern (display mode of two or more patterns) of electronic paper 400 is rewritten in the 2nd work example mentioned above, without removing electronic paper 400 from the state 100 which opened the front door 12 of the slot machine 10, i.e., a solid of revolution, as shown in drawing 2 Electronic paper 400 is removed from a solid of revolution 100, and you may make it rewrite the display pattern (display mode of two or more patterns) of electronic paper 400 by external apparatus 500 etc.

[0113]

(4) Although he is trying to establish an above-mentioned matrix circuit in the 2nd base material 220, you may make it establish an above-mentioned matrix circuit in the 1st base material 221 in the 1st work example mentioned above.

[0114]

(5) Although he is trying for a cable to receive the control signal from external apparatus in the connector area 208 and the wiring part 209, you may make it receive the control signal from external apparatus on radio in the 1st work example mentioned above, as it changes to the connector area 208 and has a receiving part.

[0115]

(6) although the control part 518 controls a stepping motor 140 by the 2nd work example mentioned above and the electronic paper 400 of a solid of revolution 100 is rotated when rewriting the display of the electronic paper 400 by external apparatus 500 in it The transportation device of other motors which are another objects in a stepping motor 140 is controlled, and you may make it rotate the electronic paper 400 of a solid of revolution 100.

[0116]

(7) In each work example mentioned above, although electronic paper 98,400 is adopted as a display means, you may adopt other display means (medium for a display etc.) to display two or more discernment information, by moving the electrification particles in the display layer pinched between the part I material and the part II material, and changing a color.

[0117]

(8) You may carry out this invention to the game machines (for example, pachinko machine etc.) of a different type from the above-mentioned work example. For example, you may carry out to the pachinko machine which is a kind of a pinball machine, the 3rd sort pachinko game machine especially called the 1st sort pachinko game machine and a right thing, etc. For example, once the 3rd sort pachinko game machine becomes it a great success, it is a pachinko machine (called a common name, a 2 times right thing, and a 3 times right thing.) with which a great success expected value is raised until a great success state occurs two or more times (for example, 2 times, 3 times) including it. Moreover, after a great success pattern is displayed, you may carry out as a pachinko machine which will be in a game state specially considering winning a prize of a predetermined field in a ball as a necessary condition. Furthermore, you may be made to carry out as various game machines, such as a game machine which what is called arrangement ball type pachinko, the mahjong ball, and a pachinko machine and a slot machine united besides the pachinko machine.

[0118]

In addition, as basic composition of a pachinko machine, have an operation handle, and predetermined carries out game field discharge of the ball according to operation of the operation handle. That by which the definite stop of the discernment information, including pattern etc., by which a dynamic indication of the ball is given in the display device by making into a necessary condition to win a prize of the operation mouth arranged in the predetermined position in a game field (or an operation gate passage) is carried out after predetermined time is mentioned. Moreover, at the time of generating of a game state, the variable winning-a-prize equipment (specific winning-a-prize mouth) arranged in the predetermined position in a game field is wide opened in a predetermined mode specially, and winning a prize of a ball is enabled. What the valuable value (not only a premium ball but the data written in a magnetic card is included) according to the winning-a-prize number is given is mentioned.

[0119]

In addition, after indicating the pattern sequence which consists of two or more patterns by change as an example of the game machine which the pachinko machine and the slot machine united, it has the variable display means which gives a definite indication of the pattern, and what is not equipped with the handle for ball shooting is mentioned. [ originate in after an injection of the ball of the specified quantity based on predetermined operation (button operation) (for example, operation of a control lever), and change of a pattern is started, originate in operation of a stop button, or ] in this case, by carrying out predetermined time progress Change of a pattern is stopped, a great success state advantageous to a game person is generated by making for the definite pattern at the time of the stop to be what is called a great success pattern into a necessary condition, and a lot of balls on a lower saucer pay out a game person.

[0120]

## [Effect of the Invention]

[ according to this invention / the solid of revolution equipped with two or more discernment information ] so that clearly from the above explanation Since it has a display means to display two or more discernment information by moving the electrification particles in the display layer pinched between the part I material and the part II material, and changing a color, two or more discernment information which was being displayed on the display means can be rewritten and displayed on new discernment information. Therefore, when making a model change etc., the discernment information on a solid of revolution can be rewritten and changed into new discernment information. [ make / part exchange of exchanging the solid of revolution itself for a new solid of revolution / unnecessary ] A model change can be made easily, continuous use of this solid of revolution can be carried out in a new display mode, without discarding the parts which constitute a solid of revolution, and generating of the abandonment parts accompanying model change can be reduced.

## [Brief Description of the Drawings]

[Drawing 1] It is a perspective view in the state where the front door of the slot machine of the 1st work example was closed.

[Drawing 2] It is a perspective view in the state where the front door of the slot machine was opened.

[Drawing 3] It is the exploded perspective view of each rotary drum equipment.

[Drawing 4] It is with the explanatory view which looked at the inside of each rotary drum equipment from the front.

[Drawing 5] It is the elements on larger scale shown the passive-movement belt pulley of each rotary drum equipment, and focusing on a driving pulley.

[Drawing 6] It is the sectional view showing the example of composition of the electronic paper of the 1st work example.

[Drawing 7] It is the sectional view showing the microcapsule of the electronic paper of the 1st work example.

[Drawing 8] It is a sectional view in case the display surface of the electronic paper of the 1st work example looks white.

[Drawing 9] It is a sectional view in case the display surface of the electronic paper of the 1st work example looks blue.

[Drawing 10] It is the figure showing the circuit composition of a circuit board typically.

[Drawing 11] It is the side view showing 1 pixel of the electronic paper of the 1st work example.

[Drawing 12] It is the side view showing 1 pixel of the electronic paper of the 1st work example.

[Drawing 13] It is the figure showing the voltage of the picture electrode of the 2nd base material, and the common electrode of the 1st base material, and the display pattern corresponding to it.

[Drawing 14] It is the sectional view showing the example of composition of the electronic paper of the 2nd work example.

[Drawing 15] It is the mimetic diagram showing signs that the electronic paper of the solid of revolution of a slot machine is rewritten using external apparatus.

[Drawing 16] (a) is the upper surface figure showing arrangement of the electrode of the record side of a recording head, and (b) is a schematic view explaining the power supply linked to a recording head.

## [Explanations of letters or numerals]

98 -- Electronic Paper (Display Means)

100 -- Solid of Revolution

208 -- Connector Area (Receiving Means)

209 -- Wiring Part (Receiving Means)

220 -- 2nd Base Material (Part II Material)

221 -- 1st Base Material (Part I Material)

222 -- Electronic Ink Layer (Display Layer)

224 -- Microcapsule (Capsule)

227 -- Electrification Particles

262 -- Gate Driver (Drive Control Means)

263 -- Source Driver (Drive Control Means)

264 -- Picture Electrode

265 -- Thin-film Transistor (Change Element)

323 -- Common Electrode

100 -- Electronic Paper (Display Means)

140 -- Display Board (Part II Material)

142 -- Non-Displaying Substrate (Part I Material)

443 -- Particle Layer (Display Layer)

436 -- Particles (Electrification Particles)

510 -- Recording Head (\*\*\* Impression Head)

518 -- Control Part (Control Means)

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[Translation done.]